CLAIMS

1. An isolated Hepatitis B virus (HBV) variant wherein said variant comprises a nucleotide mutation in a gene encoding a DNA polymerase resulting in at least one amino acid addition, substitution and/or deletion to said DNA polymerase and wherein said variant exhibits decreased sensitivity to one or more nucloside or nucleotide analogs selected from the list consisting of ADV, LMV, TFV or FTC; ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; ADV and LMV and TFV; ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; ADV and FTC and LMV and TFV, and other nucleoside or nucleotide analogs, and/or anti-HBV agents.

2. The isolated HBV variant of Claim 1 wherein the decreased sensitivity is in respect of ADV.

3. The isolated HBV variant of Claim 1 wherein the decreased sensitivity is in respect of LMV.

4. The isolated HBV variant of Claim 1 wherein the decreased sensitivity is in respect of TFV.

5. The isolated HBV variant of Claim 1 wherein the decreased sensitivity is in respect of FTC.

6. The isolated HBV variant of Claim 1 wherein the decreased sensitivity is in respect of ADV and LMV.

7. The isolated HBV variant of Claim 1 wherein the decreased sensitivity is in respect of ADV and TFV.

8. The isolated HBV variant of Claim 1 wherein the decreased sensitivity is in respect of LMV and TFV.

9. The isolated HBV variant of Claim 1 wherein the decreased sensitivity is in respect of ADV and FTC.

10. The isolated HBV variant of Claim 1 wherein the decreased sensitivity is in respect of FTC and TFV.

11. The isolated HBV variant of Claim 1 wherein the decreased sensitivity is in respect of FTC and LMV.

12. The isolated HBV variant of Claim 1 wherein the decreased sensitivity is in respect of ADV and LMV and TFC.

13. The isolated HBV variant of Claim 1 wherein the decreased sensitivity is in respect of ADV and TFV and FTC.

14. The isolated HBV variant of Claim 1 wherein the decreased sensitivity is in respect of LMV and TFV and FTC.

15. The isolated HBV variant of Claim 1 wherein the decreased sensitivity is in respect of ADV and LMV and FTC.

16. The isolated HBV variant of Claim 1 wherein the decreased sensitivity is in respect of ADV and FTC and TFV and LMV.

17. The isolated HBV variant of Claim 1 wherein said variant comprises a mutation in the DNA polymerase selected for rtT38K, rtA181V, rtR55H, rtY245H, rtS/T78S, rtV80L, rtN/S118N, rtN/K139K, rtE142V, rtA/T181A, rtI204M, rtQ/P/S/Stop215S, rtE/K21E, rtN/H238H, rtT128N, rtN236T, rtL180M, rtM204V, rtQ215S and rtT128S.

18. The isolated HBV variant of Claim 1 or 17 wherein said variant comprises a mutation in the envelope antigen selected from sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W and sS/R207R.

19. The isolated HBV variant of Claim 1 wherein said variant comprises a mutation in the DNA polymerase selected from rtN238T, rt180L, rtI204M, rtN238T, rtI187V, rtN248Q and rtS256G.

20. The isolated HBV variant of Claim 1 or 19 comprising a mutation in the envelope antigen selected from sV14A, sL95W, sV96G, sI208T/I, sL95W, and sL196W.

21. The isolated HBV variant of Claim 1 wherein said variant comprises a mutation in the DNA polymerase selected from rtI122V, rtA181T, rtL180M, rtA/V200V, rtM204V, rtV214A, rtH237H/P, rtV253G and rtN238T/A.

22. The isolated HBV variant of Claim 1 or 21 wherein said variant comprises a mutation in the envelope antigen selected from sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, and sI195M.

23. The isolated HBV variant of Claim 1 wherein said variant comprises an rtN238T mutation in the HBV polymerase.

24. The isolated HBV variant of Claim 1 or 23 wherein said variant comprises an sS53L mutation in the envelope antigen.

25. The isolated HBV variant of Claim 1 wherein said variant comprises a mutation in the DNA polymerase selected from rtN123N/I, rtS135Y, rtV214A/V and rtQ215Q/P/Stop/S.

26. The isolated HBV variant of Claim 1 or 22 wherein said variant comprises a mutation in the envelope antigen selected from sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

27. An isolated HBV variant comprising a nucleotide mutation in the S gene resulting in at least one amino acid addition, substitution and/or deletion to the surface antigen and which exhibits decreased sensitivity to one or more nucleoside or nucleotide analogs selected from the list consisting of ADV, LMV,TFV or FTC; ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; ADV and LMV and TFV; or ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; and/or ADV and FTC and LMV and TFV and other nucleoside or nucleotide analogs and/or anti-HBV agents.

28. The isolated HBV variant of Claim 27 wherein the decreased sensitivity is in respect of ADV.

29. The isolated HBV variant of Claim 27 wherein the decreased sensitivity is in respect of LMV.

30. The isolated HBV variant of Claim 27 wherein the decreased sensitivity is in respect of TFV.

31. The isolated HBV variant of Claim 27 wherein the decreased sensitivity is in respect of FTC.

32. The isolated HBV variant of Claim 27 wherein the decreased sensitivity is in respect of ADV and LMV.

33. The isolated HBV variant of Claim 27 wherein the decreased sensitivity is in respect of ADV and TFV.

34. The isolated HBV variant of Claim 27 wherein the decreased sensitivity is in respect of LMV and TFV.

35. The isolated HBV variant of Claim 27 wherein the decreased sensitivity is in respect of ADV and FTC.

36. The isolated HBV variant of Claim 27 wherein the decreased sensitivity is in respect of FTC and TFV.

37. The isolated HBV variant of Claim 27 wherein the decreased sensitivity is in respect of FTC and LMV.

38. The isolated HBV variant of Claim 27 wherein the decreased sensitivity is in respect of ADV and LMV and TFC.

39. The isolated HBV variant of Claim 27 wherein the decreased sensitivity is in respect of ADV and TFV and FTC.

40. The isolated HBV variant of Claim 27 wherein the decreased sensitivity is in respect of LMV and TFV and FTC.

41. The isolated HBV variant of Claim 27 wherein the decreased sensitivity is in respect of ADV and LMV and FTC.

42. The isolated HBV variant of Claim 27 wherein the decreased sensitivity is in respect of ADV and FTC and TFV and LMV.

43. The isolated HBV variant of Claim 27 wherein said variant comprises a mutation in the DNA polymerase selected for rtT38K, rtA181V, rtR55H, rtY245H, rtS/T78S, rtV80L, rtN/S118N, rtN/K139K, rtE142V, rtA/T181A, rtI204M, rtQ/P/S/Stop215S, rtE/K21E, rtN/H238H, rtT128N, rtN236T, rtL180M, rtM204V, rtQ215S and rtT128S.

44. The isolated HBV variant of Claim 27 or 43 wherein said variant comprises a mutation in the envelope antigen selected from sQ30K, sE44G. sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W and sS/R207R.

45. The isolated HBV variant of Claim 27 wherein said variant comprises a mutation in the DNA polymerase selected from rtN238T, rt180L, rtI204M, rtN238T, rtI187V, rtN248Q and rtS256G,.

46. The isolated HBV variant of Claim 27 or 45 comprising a mutation in the envelope antigen selected from sV14A, sL95W, sV96G, sI208T/I, sL95W, and sL196W.

47. The isolated HBV variant of Claim 27 wherein said variant comprises a mutation in the DNA polymerase selected from rtI122V, rtA181T, rtL180M, rtA/V200V, rtM204V, rtV214A, rtH237H/P, rtV253G and rtN238T/A.

48. The isolated HBV variant of Claim 27 or 47 wherein said variant comprises a mutation in the envelope antigen selected from sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, and sI195M.

49. The isolated HBV variant of Claim 27 wherein said variant comprises an rtN238T mutation in the HBV polymerase.

50. The isolated HBV variant of Claim 27 or 49 wherein said variant comprises an sS53L mutation in the envelope antigen.

51. The isolated HBV variant of Claim 27 wherein said variant comprises a mutation in the DNA polymerase selected from rtN123N/I, rtS135Y, rtV214A/V and rtQ215Q/P/Stop/S.

52. The isolated HBV variant of Claim 27 or 51 wherein said variant comprises a mutation in the envelope antigen selected from sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

53. A method for determining the potential for an HBV to exhibit reduced sensitivity to a nucleoside or nucleotide analog selected from ADV, LMV, TFV and FTC or optionally other nucleoside or nucleotide analogs, said method comprising isolating DNA or corresponding mRNA from said HBV and screening for a mutation in the nucleotide sequence encoding HBV DNA polymerase resulting in at least one amino acid substitution, deletion and/or addition in any one or more of domains F and A through E or a region proximal thereto of said DNA polymerase and associated with resistance or decreases sensitivity to one or more of ADV, LMV, TFV and/or FTC wherein the presence of such a mutation is an indication of the likelihood of resistance to said one or more of ADV, LMV, TFV and/or FTC.

54. The method of Claim 53 wherein the mutation screened for is selected from rtT38K, rtA181V, rtR55H, rtY245H, rtS/T78S, rtV80L, rtN/S118N, rtN/K139K, rtE142V, rtA/T181A, rtI204M, rtQ/P/S/Stop215S, rtE/K21E, rtN/H238H, rtT128N, rtN236T, rtL180M, rtM204V, rtQ215S and rtT128S or a combination thereof or an equivalent mutation.

55. The method of Claim 53 or 54 wherein the mutation screened for is selected from sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W and sS/R207R or a combination thereof or an equivalent mutation.

56. The method of Claim 53 wherein the mutation screened for is selected from rtN238T, rtI80L, rtI204M, rtN238T, rtI187V, rtN248Q and rtS256G, or a combination thereof or an equivalent mutation.

57. The method of Claim 53 or 56 wherein the mutation screened for is selected from sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W and sV14A or a combination thereof or an equivalent mutation.

58. The method of Claim 53 wherein said variant comprises a mutation in the DNA polymerase selected from rtI122V, rtA181T, rtL180M, rtA/V200V, rtM204V, rtV214A, rtH237H/P, rtV253G and rtN238T/A.

59. The method of Claim 53 or 58 wherein said variant comprises a mutation in the envelope antigen selected from sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, and sI195M.

60. The method of Claim 53 wherein the mutation screened for is selected from rtN238T mutation in the HBV polymerase or a combination thereof or an equivalent mutation.

61. The method of Claim 53 or 60 wherein the mutation screened for is selected from sS53L mutation in the envelope antigen or a combination thereof or an equivalent mutation.

62. The isolated HBV variant of Claim 53 wherein said variant comprises a mutation in the DNA polymerase selected from rtN123N/I, rtS135Y, rtV214A/V and rtQ215Q/P/Stop/S.

63. The isolated HBV variant of Claim 53 or 61 wherein said variant comprises a mutation in the envelope antigen selected from sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

64. A method for determining whether an HBV strain exhibits reduced sensitivity to a nucleoside or nucleotide analog, said method comprising isolating DNA or corresponding mRNA from said HBV and screening for a mutation in the nucleotide sequence encoding

the DNA polymerase wherein the presence of a mutation in a region selected from the F to G domain, between F and A domains, the A domain, between the A and B domains, the B domain, between the B and C domains, to C domain, between the C and D domains, the D domain, between the D and E domain and the E domain or combinations thereof or an equivalent one or more other mutation is indicative of a variant wherein said variant exhibits a decreased sensitivity to one or more of ADV, LMV, TFV and/or FTC optionally other nucleoside or nucleotide analogs.

65. The method of Claim 64 wherein the mutation screened for is selected from rtT38K, rtA181V, rtR55H, rtY245H, rtS/T78S, rtV80L, rtN/S118N, rtN/K139K, rtE142V, rtA/T181A, rtI204M, rtQ/P/S/Stop215S, rtE/K211E, rtN/H238H, rtT128N, rtN236T, rtL180M, rtM204V, rtQ215S and rtT128S or a combination thereof or an equivalent mutation.

66. The method of Claim 64 or 65 wherein the mutation screened for is selected from sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W and sS/R207R or a combination thereof or an equivalent mutation.

67. The method of Claim 64 wherein the mutation screened for is selected from rtN238T, rt180L, rtI204M, rtN238T, rtI187V, rtN248Q and rtS256G, or a combination thereof or an equivalent mutation.

68. The method of Claim 64 or 67 wherein the mutation screened for is selected from sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W and sV14A or a combination thereof or an equivalent mutation.

69. The method of Claim 64 wherein said variant comprises a mutation in the DNA polymerase selected from rtI122V, rtA181T, rtL180M, rtA/V200V, rtM204V, rtV214A, rtH237H/P, rtV253G and rtN238T/A.

70. The method of Claim 64 or 69 wherein said variant comprises a mutation in the envelope antigen selected from sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, and sI195M.

71. The method of Claim 64 wherein the mutation screened for is selected from rtN238T mutation in the HBV polymerase or a combination thereof or an equivalent mutation.

72. The method of Claim 64 or 71 wherein the mutation screened for is selected from sS53L mutation in the envelope antigen or a combination thereof or an equivalent mutation.

73. The method of Claim 64 wherein said variant comprises a mutation in the DNA polymerase selected from rtN123N/I, rtS135Y, rtV214A/V and rtQ215Q/P/Stop/S.

74. The method of Claim 64 or 73 wherein said variant comprises a mutation in the envelope antigen selected from sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

75. A method for detecting an agent which exhibits inhibitory activity to an HBV which exhibits resistance or decreased sensitivity to one or more of ADV, LMV, TFV and/or FTC said method comprising:

generating a genetic construct comprising a replication competent-effective amount of the genome from said HBV contained in a plasmid vector and then transfecting said cells with said construct;

contacting said cells, before, during and/or after transfection, with the agent to be tested;

culturing said cells for a time and under conditions sufficient for the HBV to replicate, express genetic sequences and/or assemble and/or release virus or virus-like particles if resistant to said agent; and

subjecting the cells, cell lysates or culture supernatant fluid to viral- or viral-component-detection means to determine whether or not the virus has replicated, expressed genetic material and/or assembled and/or been released in the presence of said agent.

76. The method of Claim 75 wherein the HBV variant comprises a mutation selected from rtT38K, rtA181V, rtR55H, rtY245H, rtS/T78S, rtV80L, rtN/S118N, rtN/K139K, rtE142V, rtA/T181A, rtI204M, rtQ/P/S/Stop215S, rtE/K21E, rtN/H238H, rtT128N, rtN236T, rtL180M, rtM204V, rtQ215S and rtT128S.

77. The method of Claim 75 or 76 wherein the HBV variant comprises a mutation selected from sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W and sS/R207R.

78. The method of Claim 75 wherein the HBV variant comprises a mutation selected from rtN238T, rt180L, rtI204M, rtN238T, rtI187V, rtN248Q and rtS256G,.

79. The method of Claim 75 or 78 wherein the HBV variant comprises a mutation selected from sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W and sV14A.

80. The method of Claim 75 or 78 wherein the HBV variant comprises a mutation selected from rtI122V, rtA181T, rtL180M, rtA/V200V, rtM204V, rtV214A, rtH237H/P, rtV253G and rtN238T/A.

81. The method of Claim 75 or 80 wherein said variant comprises a mutation in the envelope antigen selected from sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, and sI195M.

82. The method of Claim 75 wherein said variant comprises a mutation in the DNA polymerase selected from rtI122V, rtA181T, rtL180M, rtA/V200V, rtM204V, rtV214A, rtH237H/P, rtV253G and rtN238T/A.

83. The method of Claim 75 or 82 wherein the HBV variant comprises a mutation selected from sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, sI195M,

84. The method of Claim 75 wherein the HBV variant comprises a mutation selected from rtN38T mutation in the HBV polymerae.

85. The method of Claim 75 or 84 wherein the HBV variant comprises a mutation selected from sS53L mutation in the envelope antigen.

86. The method of Claim 75 wherein said variant comprises a mutation in the DNA polymerase selected from rtN123N/I, rtS135Y, rtV214A/V and rtQ215Q/P/Stop/S.

87. The method of Claim 75 or 86 wherein said variant comprises a mutation in the envelope antigen selected from sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

88. A computer product for assessing the likely usefulness of a viral variant or biological sample comprising same for determining an appropriate therapeutic protocol in a subject, said product comprising:

(1) code that receives as input code for at least two features associated with said viral agents or biological sample comprising same, wherein said features are selected from:

(a) the ability to exhibit resistance for reduced sensitivity to a particular compound or immunological agent;

(b) an altered DNA polymerase from wild-type HBV;

(c) an altered surface antigen from wild-type HBV; or

(d) morbidity or recovery potential of a patient;

(2) code that adds said input code to provide a sum corresponding to a value for said viral variants or biological samples; and

(3) a computer readable medium that stores the codes.

89. A computer for assessing the likely usefulness of a variant or biological sample comprising same in a subject, wherein said computer comprises:

(1) a machine-readable data storage medium comprising a data storage material encoded with machine-readable data, wherein said machine-readable data comprise input codes for at least two features associated with said viral variant or biological sample; wherein said features are selected from:-

(a) the ability to exhibit resistance for reduced sensitivity to a particular compound or immunological agent;

(b) an altered DNA polymerase from wild-type HBV;

(c) an altered surface antigen from wild-type HBV; or

(d) morbidity or recovery potential of a patient;

(2) a working memory for storing instructions for processing said machine-readable data;

(3) a central-processing unit coupled to said working memory and to said machine-readable data storage medium, for processing said machine readable data to provide a sum of said input code corresponding to a value for said compound(s); and

(4) an output hardware coupled to said central processing unit, for receiving said value.

90. The computer product or composition of Claim 88 or 89 wherein the input code is resistant to one or more of ADV, LMV, TFV and/or FTC.

91. The computer product or composition of Claim 88 or 89 or 90 wherein the input code is a mutation selected from rtT38K, rtA181V, rtR55H, rtY245H, rtS/T78S, rtV80L, rtN/S118N, rtN/K139K, rtE142V, rtA/T181A, rtI204M, rtQ/P/S/Stop215S, rtE/K21E, rtN/H238H, rtT128N, rtN236T, rtL180M, rtM204V, rtQ215S and rtT128S.

92. The computer product or composition of Claim 88 or 89 or 90 or 91 wherein the input code is a mutation selected from sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F,

sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W and sS/R207R.

93. The computer product or composition of Claim 88 or 89 or 90 wherein the input code is a mutation selected from rtN238T, rtI80L, rtI204M, rtN238T, rtI187V, rtN248Q and rtS256G,.

94. The computer product or composition of Claim 88 or 89 or 90 or 93 wherein the input code is a mutation selected from sV14A, sL95W, sV96G, sI208T/I, sL95W, and sL196W.

95. The computer product or composition of Claim 88 or 89 or 90 wherein the input code is a mutation selected from rtI122V, rtA181T, rtH237H/P, rtL180M, rtA/V200V, rtM204V, rtV214A, rtH237H/P, rtV253G and rtN238T/A.

96. The computer product or composition of Claim 88 or 89 or 90 or 95 wherein the input code is a mutation selected from sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, sI195M,

97. The computer product or composition of Claim 88 or 89 or 90 wherein the input code is a mutation selected from rtN238T mutation in the HBV polymerase.

98. The computer product or composition of Claim 88 or 89 or 90 or 97 wherein the input code is a mutation selected from sS53L mutation in the envelope antigen.

99. The computer product or composition of Claim 88 or 89 or 90 wherein said variant comprises a mutation in the DNA polymerase selected from rtN123N/I, rtS135Y, rtV214A/V and rtQ215Q/P/Stop/S.

100. The computer product of Claim 88 or 90 or 99 wherein said variant comprises a mutation in the envelope antigen selected from sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

101. Use of an HBV variant in the manufacture of a medicament for the treatment or prophylaxis of HBV infection.

102. Use of Claim 101 wherein the HBV variant is resistant to one or more of ADV, LMV, TFV and/or FTC.

103. Use of Claim 101 or 102 wherein the HBV variant comprises a mutation selected from rtT38K, rtA181V, rtR55H, rtY245H, rtS/T78S, rtV80L, rtN/S118N, rtN/K139K, rtE142V, rtA/T181A, rtI204M, rtQ/P/S/Stop215S, rtE/K21E, rtN/H238H, rtT128N, rtN236T, rtL180M, rtM204V, rtQ215S and rtT128S.

104. Use of Claim 101 or 102 or 103 wherein the HBV variant comprises a mutation selected from sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W and sS/R207R.

105. Use of Claim 101 or 102 wherein the HBV variant comprises a mutation selected from rtN238T, rt180L, rtI204M, rtN238T, rtI187V, rtN248Q and rtS256G.

106. Use of Claim 101 or 102 or 105 wherein the HBV variant comprises a mutation selected from sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W and sV14A.

107. Use of Claim 101 or 102 wherein the HBV variant comprises a mutation selected from rtI122V, rtA181T, rtH237H/P, rtL180M, rtA/V200V, rtM204V, rtV214A, rtH237H/P, rtV253G and rtN238T/A.

108. Use of Claim 101 or 102 or 107 wherein the HBV variant comprises a mutation selected from sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, and sI195M.

109. Use of Claim 101 or 102 wherein the HBV variant comprises a mutation selected from rtN238T mutation in the HBV polymerase.

110. Use of Claim 101 or 102 or 109 wherein the HBV variant comprises a mutation selected from sS53L mutation in the envelope antigen.

111. Use of Claim 101 wherein said variant comprises a mutation in the DNA polymerase selected from rtN123N/I, rtS135Y, rtV214A/V and rtQ215Q/P/Stop/S.

112. Use of Claim 101 or 111 wherein said variant comprises a mutation in the envelope antigen selected from sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

113. A method for detecting a variant HBV exhibiting an altered immunological profile said method comprising isolating an HBV from a subject exposed to a nucleoside or nucleotide analog selected from the listed consisting of ADV, LMV, TFV or FTC; ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; ADV and LMV and TFV; ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; ADV and FTC and LMV and TFV, and then contacting said HBV with a panel of one or more antibodies to a surface antigen and screening for any change in binding affinity or binding spectrum.

114. A method for detecting a variant HBV exhibiting an altered immunological profile said method comprising isolating a serum sample from a subject exposed to a nucleoside or nucleotide analog selected from the listed consisting of ADV, LMV, TFV or FTC; ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; ADV and LMV and TFV; ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; ADV and FTC and LMV and TFV, and then contacting the serum with a panel of HBV surface antigens or antibody-binding fragments thereof and screening for any change in binding affinity or binding spectrum.

115. The method of Claim 113 or 114 wherein the HBV variant comprises a mutation selected from rtT38K, rtA181V, rtR55H, rtY245H, rtS/T78S, rtV80L, rtN/S118N, rtN/K139K, rtE142V, rtA/T181A, rtI204M, rtQ/P/S/Stop215S, rtE/K21E, rtN/H238H, rtT128N, rtN236T, rtL180M, rtM204V, rtQ215S and rtT128S.

116. The method of Claim 113 or 114 or 115 wherein the HBV variant comprises a mutation selected from sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W and sS/R207R.

117. The method of Claim 113 or 114 wherein the HBV variant comprises a mutation selected from rtN238T, rt180L, rtI204M, rtN238T, rtI187V, rtN248Q and rtS256G.

118. The method of Claim 113 or 114 or 117 wherein the HBV variant comprises a mutation selected from sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W and sV14A.

119. The method of Claim 113 or 114 wherein the HBV variant comprises a mutation selected from rtI122V, rtA181T, rtL180M, rtA/V200V, rtM204V, rtV214A, rtH237H/P, rtV253G and rtN238T/A.

120. The method of Claim 113 or 114 or 119 wherein the HBV variant comprises a mutation selected from sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, and sI195M.

121. The method of Claim 113 or 114 wherein the HBV variant comprises a mutation rtN238T.

122. The method of Claim 113 or 114 or 121 wherein the HBV variant comprises a mutation sS53L.

123. The method of Claim 113 or 114 wherein said variant comprises a mutation in the DNA polymerase selected from rtN123N/I, rtS135Y, rtV214A/V and rtQ215Q/P/Stop/S.

124. The method of Claim 113 or 114 or 123 wherein said variant comprises a mutation in the envelope antigen selected from sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

125. A kit for an assay for variant HBV resistant to ADV, LMV, TFV, or FTC; or ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; or ADV and LMV and TFV; or ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; or ADV and FTC and LMV and TFV, said kit comprising genetic agents capable of detecting an altered DNA polymerase gene and/or a altered surface antigen gene on the HBV variant.

126. A kit for an assay for variant HBV resistant to ADV, LMV, TFV, or FTC; or ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; or ADV and LMV and TFV; or ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; or ADV and FTC and LMV and TFV, said kit comprising peptide or antibody agents capable of binding to an HBV surface antigen or antibody thereto.

127. The kit of Claim 124 further comprising reagent for PCR or other nucleic acid hydrogen.

128. The kit of Claim 124 or 126 further comprising an immobilized oligonucleotide or oligopeptide.

129. A method for determining the potential for an HBV to exhibit reduced sensitivity to ADV, LMV, TFV, or FTC; or ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; or ADV and LMV and TFV; or ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; or ADV and FTC and LMV and TFV and/or optionally other nucleoside or nucleotide analogs or other anti-HBV agents or

combination thereof, said method comprising isolating DNA or corresponding mRNA from said HBV and screening for a mutation in the nucleotide sequence encoding HBV DNA polymerase resulting in at least one amino acid substitution, deletion and/or addition in any one or more of domains F and G, and domains A through to E or a region proximal thereto of said DNA polymerase and associated with resistance or decreased sensitivity to ADV, LMV, TFV, or FTC; or ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; or ADV and LMV and TFV; or ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; or ADV and FTC and LMV and TFV, wherein the presence of such a mutation is an indication of the likelihood of resistance to said ADV, LMV, TFV, or FTC; or ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; or ADV and LMV and TFV; or ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; or ADV and FTC and LMV and TFV.

130. A vaccine comprising an agent selected from a surface component of a variant HBV as defined in any one of Claims 1 to 50; a combination of a variant HBV as defined in any one of Claims 1 to 50 and another anti-HBV agent; and an agent inhibitory to a variant HBV as defined in any one of Claims 1 to 50.

CLAIMS

1. An isolated Hepatitis B virus (HBV) variant wherein said variant comprises a nucleotide mutation in a gene encoding a DNA polymerase resulting in at least one amino acid addition, substitution and/or deletion to said DNA polymerase and wherein said variant exhibits decreased sensitivity to one or more nucloside or nucleotide analogs selected from the list consisting of ADV, LMV, TFV or FTC; ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; ADV and LMV and TFV; ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; ADV and FTC and LMV and TFV, and other nucleoside or nucleotide analogs, and/or anti-HBV agents wherein said variant comprises a mutation in the DNA polymerase selected from the list consisting of rT38K, rA181V, rR55H, rY245H, rS/T78S, rV80L, rN/S118N, rN/K139K, rE142V, rA/T181A, rI204M, rQ/P/S/Stop215S, rE/K21E, rN/H238H, rT128N, rN236T, rL180M, rM204V, rQ215S, rT128S, rN238T, rI80L, rI204M, rN238T, rI187V, rN248Q, rS256G, rI122V, rA181T, rL180M, rA/V200V, rM204V, rV214A, rH237H/P, rV253G, rN238T/A, rN238T, rN123N/I, rS135Y, rV214A/V and rQ215Q/P/Stop/S.

2. The isolated HBV of Claim 1 wherein the variant comprises a mutation in the surface protein selected from the list consisting of sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W, sS/R207R, sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W, sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, sI195M, sS53L, sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

3. The isolated HBV variant of Claim 1 or 2 wherein the decreased sensitivity is in respect of ADV.

4. The isolated HBV variant of Claim 1 or 2 wherein the decreased sensitivity is in respect of LMV.

5. The isolated HBV variant of Claim 1 or 2 wherein the decreased sensitivity is in respect of TFV.

6. The isolated HBV variant of Claim 1 or 2 wherein the decreased sensitivity is in respect of FTC.

7. The isolated HBV variant of Claim 1 or 2 wherein the decreased sensitivity is in respect of ADV and LMV.

8. The isolated HBV variant of Claim 1 or 2 wherein the decreased sensitivity is in respect of ADV and TFV.

9. The isolated HBV variant of Claim 1 or 2 wherein the decreased sensitivity is in respect of LMV and TFV.

10. The isolated HBV variant of Claim 1 or 2 wherein the decreased sensitivity is in respect of ADV and FTC.

11. The isolated HBV variant of Claim 1 or 2 wherein the decreased sensitivity is in respect of FTC and TFV.

12. The isolated HBV variant of Claim 1 or 2 wherein the decreased sensitivity is in respect of FTC and LMV.

13. The isolated HBV variant of Claim 1 or 2 wherein the decreased sensitivity is in respect of ADV and LMV and TFC.

14. The isolated HBV variant of Claim 1 or 2 wherein the decreased sensitivity is in respect of ADV and TFV and FTC.

15. The isolated HBV variant of Claim 1 or 2 wherein the decreased sensitivity is in respect of LMV and TFV and FTC.

16. The isolated HBV variant of Claim 1 or 2 wherein the decreased sensitivity is in respect of ADV and LMV and FTC.

17. The isolated HBV variant of Claim 1 or 2 wherein the decreased sensitivity is in respect of ADV and FTC and TFV and LMV.

18. An isolated HBV variant comprising a nucleotide mutation in the S gene resulting in at least one amino acid addition, substitution and/or deletion to the surface antigen and which exhibits decreased sensitivity to one or more nucleoside or nucleotide analogs selected from the list consisting of ADV, LMV,TFV or FTC; ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; ADV and LMV and TFV; or ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; and/or ADV and FTC and LMV and TFV and other nucleoside or nucleotide analogs and/or anti-HBV agents wherein the variant comprises a mutation in the surface protein selected from the list of sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W, sS/R207R, sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W, sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, sI195M, sS53L, sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

19. An isolated HBV variant of Claim 18 wherein the variant comprises a mutation in the HBV DNA polymerase selected from the list consisting of rtT38K, rtA181V, rtR55H, rtY245H, rtS/T78S, rtV80L, rtN/S118N, rtN/K139K, rtE142V, rtA/T181A, rtI204M, rtQ/P/S/Stop215S, rtE/K21E, rtN/H238H, rtT128N, rtN236T, rtL180M, rtM204V, rtQ215S, rtT128S, rtN238T, rtI80L, rtI204M, rtN238T, rtI187V, rtN248Q, rtS256G, rtI122V, rtA181T, rtL180M, rtA/V200V, rtM204V, rtV214A, rtH237H/P, rtV253G, rtN238T/A, rtN238T, rtN123N/I, rtS135Y, rtV214A/V and rtQ215Q/P/Stop/S.

20. The isolated HBV variant of Claim 18 or 19 wherein the decreased sensitivity is in respect of ADV.

21. The isolated HBV variant of Claim 18 or 19 wherein the decreased sensitivity is in respect of LMV.

22. The isolated HBV variant of Claim 18 or 19 wherein the decreased sensitivity is in respect of TFV.

23. The isolated HBV variant of Claim 18 or 19 wherein the decreased sensitivity is in respect of FTC.

24. The isolated HBV variant of Claim 18 or 19 wherein the decreased sensitivity is in respect of ADV and LMV.

25. The isolated HBV variant of Claim 18 or 19 wherein the decreased sensitivity is in respect of ADV and TFV.

26. The isolated HBV variant of Claim 18 or 19 wherein the decreased sensitivity is in respect of LMV and TFV.

27. The isolated HBV variant of Claim 18 or 19 wherein the decreased sensitivity is in respect of ADV and FTC.

28. The isolated HBV variant of Claim 18 or 19 wherein the decreased sensitivity is in respect of FTC and TFV.

29. The isolated HBV variant of Claim 18 or 19 wherein the decreased sensitivity is in respect of FTC and LMV.

30. The isolated HBV variant of Claim 18 or 19 wherein the decreased sensitivity is in respect of ADV and LMV and TFC.

31. The isolated HBV variant of Claim 18 or 19 wherein the decreased sensitivity is in respect of ADV and TFV and FTC.

32. The isolated HBV variant of Claim 18 or 19 wherein the decreased sensitivity is in respect of LMV and TFV and FTC.

33. The isolated HBV variant of Claim 18 or 19 wherein the decreased sensitivity is in respect of ADV and LMV and FTC.

34. The isolated HBV variant of Claim 18 or 19 wherein the decreased sensitivity is in respect of ADV and FTC and TFV and LMV.

35. A method for determining the potential for an HBV to exhibit reduced sensitivity to a nucleoside or nucleotide analog selected from ADV, LMV, TFV and FTC or optionally other nucleoside or nucleotide analogs, said method comprising isolating DNA or corresponding mRNA from said HBV and screening for a mutation in the nucleotide sequence encoding HBV DNA polymerase resulting in at least one amino acid substitution, deletion and/or addition in any one or more of domains F and A through E or a region proximal thereto of said DNA polymerase and associated with resistance or decreases sensitivity to one or more of ADV, LMV, TFV and/or FTC wherein the presence of such a mutation is an indication of the likelihood of resistance to said one or more of ADV, LMV, TFV and/or FTC wherein the mutation screened for in the DNA polymerase is selected from the listing consisting of rtT38K, rtA181V, rtR55H, rtY245H, rtS/T78S, rtV80L, rtN/S118N, rtN/K139K, rtE142V, rtA/T181A, rtI204M, rtQ/P/S/Stop215S, rtE/K21E, rtN/H238H, rtT128N, rtN236T, rtL180M, rtM204V, rtQ215S, rtT128S, rtN238T, rt180L, rtI204M, rtN238T, rtI187V, rtN248Q, rtS256G, rtI122V, rtA181T, rtL180M, rtA/V200V, rtM204V, rtV214A, rtH237H/P, rtV253G, rtN238T/A, rtN238T, rtN123N/I, rtS135Y,

36. The method of an HBV of Claim 35 wherein the mutation screened for is in the surface protein selected from the list consisting of sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W, sS/R207R, sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W, sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, sI195M, sS53L, sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

37. A method for determining whether an HBV strain exhibits reduced sensitivity to a nucleoside or nucleotide analog, said method comprising isolating DNA or corresponding mRNA from said HBV and screening for a mutation in the nucleotide sequence encoding the DNA polymerase wherein the presence of a mutation in a region selected from the F to G domain, between F and A domains, the A domain, between the A and B domains, the B domain, between the B and C domains, to C domain, between the C and D domains, the D domain, between the D and E domain and the E domain or combinations thereof or an equivalent one or more other mutation is indicative of a variant wherein said variant exhibits a decreased sensitivity to one or more of ADV, LMV, TFV and/or FTC optionally other nucleoside or nucleotide analogs wherein said variant comprises a mutation in the DNA polymerase selected from the list consisting of rT38K, rA181V, rR55H, rY245H, rS/T78S, rV80L, rN/S118N, rN/K139K, rE142V, rA/T181A, rI204M, rQ/P/S/Stop215S, rE/K21E, rN/H238H, rT128N, rN236T, rL180M, rM204V, rQ215S, rT128S, rN238T, r180L, rI204M, rN238T, rI187V, rN248Q, rS256G, rI122V, rA181T, rL180M, rA/V200V, rM204V, rV214A, rH237H/P, rV253G, rN238T/A, rN238T, rN123N/I, rS135Y, rV214A/V and rQ215Q/P/Stop/S.

38. The method of Claim 37 wherein the variant comprises a mutation in the surface protein selected from the listing consisting of sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W, sS/R207R, sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W, sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, sI195M, sS53L, sL42R, SQ102Q/R,

39. A method for detecting an agent which exhibits inhibitory activity to an HBV which exhibits resistance or decreased sensitivity to one or more of ADV, LMV, TFV and/or FTC said method comprising:

generating a genetic construct comprising a replication competent-effective amount of the genome from said HBV contained in a plasmid vector and then transfecting said cells with said construct;

contacting said cells, before, during and/or after transfection, with the agent to be tested;

culturing said cells for a time and under conditions sufficient for the HBV to replicate, express genetic sequences and/or assemble and/or release virus or virus-like particles if resistant to said agent; and

subjecting the cells, cell lysates or culture supernatant fluid to viral- or viral-component-detection means to determine whether or not the virus has replicated, expressed genetic material and/or assembled and/or been released in the presence of said agent,

wherein the HBV variant comprises a mutation in the DNA polymerase selected from the listing consisting of rtT38K, rtA181V, rtR55H, rtY245H, rtS/T78S, rtV80L, rtN/S118N, rtN/K139K, rtE142V, rtA/T181A, rtI204M, rtQ/P/S/Stop215S, rtE/K21E, rtN/H238H, rtT128N, rtN236T, rtL180M, rtM204V, rtQ215S, rtT128S, rtN238T, rt180L, rtI204M, rtN238T, rtI187V, rtN248Q, rtS256G, rtI122V, rtA181T, rtL180M, rtA/V200V, rtM204V, rtV214A, rtH237H/P, rtV253G, rtN238T/A, rtN238T, rtN123N/I, rtS135Y, rtV214A/V and rtQ215Q/P/Stop/S.

40. The method of Claim 39 wherein the HBV variant comprises a mutation in the surface protein selected from the list consisting of sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W, sS/R207R, sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W, sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, sI195M, sS53L, sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

41. A computer product for assessing the likely usefulness of a viral variant or biological sample comprising same for determining an appropriate therapeutic protocol in a subject, said product comprising:

(1) code that receives as input code for at least two features associated with said viral agents or biological sample comprising same, wherein said features are selected from:

(a) the ability to exhibit resistance for reduced sensitivity to a particular compound or immunological agent;

(b) an altered DNA polymerase from wild-type HBV;

(c) an altered surface protein from wild-type HBV; or

(d) morbidity or recovery potential of a patient;

(2) code that adds said input code to provide a sum corresponding to a value for said viral variants or biological samples; and

(3) a computer readable medium that stores the codes;

wherein the altered DNA polymerase is selected from the list consisting of rT38K, rA181V, rR55H, rY245H, rS/T78S, rV80L, rN/S118N, rN/K139K, rE142V, rA/T181A, rI204M, rQ/P/S/Stop215S. rE/K21E, rN/H238H, rT128N, rN236T, rL180M, rM204V, rQ215S, rT128S, rN238T, r180L, rI204M, rN238T, rI187V, rN248Q, rS256G, rI122V, rA181T, rL180M, rA/V200V, rM204V, rV214A, rH237H/P, rV253G, rN238T/A, rN238T, rN123N/I, rS135Y, rV214A/V and rQ215Q/P/Stop/S;

wherein the altered surface antigen is selected from the list consisting of sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W, sS/R207R, sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W, sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, sI195M, sS53L, sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

42. A computer for assessing the likely usefulness of a variant or biological sample comprising same in a subject, wherein said computer comprises:

(1) a machine-readable data storage medium comprising a data storage material

codes for at least two features associated with said viral variant or biological sample; wherein said features are selected from:-

(a) the ability to exhibit resistance for reduced sensitivity to a particular compound or immunological agent;

(b) an altered DNA polymerase from wild-type HBV;

(c) an altered surface protein from wild-type HBV; or

(d) morbidity or recovery potential of a patient;

(2) a working memory for storing instructions for processing said machine-readable data;

(3) a central-processing unit coupled to said working memory and to said machine-readable data storage medium, for processing said machine readable data to provide a sum of said input code corresponding to a value for said compound(s); and

(4) an output hardware coupled to said central processing unit, for receiving said value;

wherein the altered DNA polymerase is selected from the list consisting of rtT38K, rtA181V, rtR55H, rtY245H, rtS/T78S, rtV80L, rtN/S118N, rtN/K139K, rtE142V, rtA/T181A, rtI204M, rtQ/P/S/Stop215S, rtE/K21E, rtN/H238H, rtT128N, rtN236T, rtL180M, rtM204V, rtQ215S, rtT128S, rtN238T, rt180L, rtI204M, rtN238T, rtI187V, rtN248Q, rtS256G, rtI122V, rtA181T, rtL180M, rtA/V200V, rtM204V, rtV214A, rtH237H/P, rtV253G, rtN238T/A, rtN238T, rtN123N/I, rtS135Y, rtV214A/V and rtQ215Q/P/Stop/S;

wherein the altered surface antigen is selected from the list consisting of sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W, sS/R207R, sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W, sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, sI195M, sS53L, sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

43. The computer product or composition of Claim 41 or 42 wherein the input code is resistant to one or more of ADV, LMV, TFV and/or FTC.

44. Use of an HBV variant in the manufacture of a medicament for the treatment or prophylaxis of HBV infection said HBV variant comprising a mutation in the DNA polymerase selected from the list consisting of rT38K, rA181V, rR55H, rY245H, rS/T78S, rV80L, rN/S118N, rN/K139K, rE142V, rA/T181A, rI204M, rQ/P/S/Stop215S, rE/K21E, rN/H238H, rT128N, rN236T, rL180M, rM204V, rQ215S, rT128S, rN238T, r180L, rI204M, rN238T, rI187V, rN248Q, rS256G, rI122V, rA181T, rL180M, rA/V200V, rM204V, rV214A, rH237H/P, rV253G, rN238T/A, rN238T, rN123N/I, rS135Y, rV214A/V and rQ215Q/P/Stop/S and/or a mutation in the surface protein selected from the list consisting of sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W, sS/R207R, sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W, sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, sI195M, sS53L, sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

45. Use of Claim 44 wherein the HBV variant is resistant to one or more of ADV, LMV, TFV and/or FTC.

46. A method for detecting a variant HBV exhibiting an altered immunological profile said method comprising isolating an HBV from a subject exposed to a nucleoside or nucleotide analog selected from the listed consisting of ADV, LMV, TFV or FTC; ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; ADV and LMV and TFV; ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; ADV and FTC and LMV and TFV, and then contacting said HBV with a panel of one or more antibodies to a surface antigen and screening for any change in binding affinity or binding spectrum said variant HBV comprising a mutation in the surface protein selected from the listing consisting of sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W, sS/R207R, sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W, sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, sI195M, sS53L, sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

47. The method of Claim 46 wherein the variant HBV comprises a mutation in the DNA polymerase selected from the listing consisting of rT38K, rA181V, rR55H, rY245H, rS/T78S, rV80L, rN/S118N, rN/K139K, rE142V, rA/T181A, rI204M, rQ/P/S/Stop215S, rE/K21E, rN/H238H, rT128N, rN236T, rL180M, rM204V, rQ215S, rT128S, rN238T, r180L, rI204M, rN238T, rI187V, rN248Q, rS256G, rI122V, rA181T, rL180M, rA/V200V, rM204V, rV214A, rH237H/P, rV253G, rN238T/A, rN238T, rN123N/I, rS135Y, rV214A/V and rQ215Q/P/Stop/S.

48. A kit for an assay for variant HBV resistant to ADV, LMV, TFV, or FTC; or ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; or ADV and LMV and TFV; or ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; or ADV and FTC and LMV and TFV, said kit comprising genetic agents capable of detecting an altered DNA polymerase gene and/or a altered surface antigen gene on the HBV variant wherein the altered DNA polymerase is selected from the list consisting of rT38K, rA181V, rR55H, rY245H, rS/T78S, rV80L, rN/S118N, rN/K139K, rE142V, rA/T181A, rI204M, rQ/P/S/Stop215S, rE/K21E, rN/H238H, rT128N, rN236T, rL180M, rM204V, rQ215S, rT128S, rN238T, r180L, rI204M, rN238T, rI187V, rN248Q, rS256G, rI122V, rA181T, rL180M, rA/V200V, rM204V, rV214A, rH237H/P, rV253G, rN238T/A, rN238T, rN123N/I, rS135Y, rV214A/V and rQ215Q/P/Stop/S wherein the altered surface antigen is selected from the list consisting of sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W, sS/R207R, sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W, sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, sI195M, sS53L, sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

49. A kit for an assay for variant HBV resistant to ADV, LMV, TFV, or FTC; or ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; or ADV and LMV and TFV; or ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; or ADV and FTC and LMV and TFV, said kit comprising peptide or

surface antigen comprising a mutation selected from the list consisting of sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W, sS/R207R, sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W, sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, sI195M, sS53L, sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

50. A method for determining the potential for an HBV to exhibit reduced sensitivity to ADV, LMV, TFV, or FTC; or ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; or ADV and LMV and TFV; or ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; or ADV and FTC and LMV and TFV and/or optionally other nucleoside or nucleotide analogs or other anti-HBV agents or combination thereof, said method comprising isolating DNA or corresponding mRNA from said HBV and screening for a mutation in the nucleotide sequence encoding HBV DNA polymerase resulting in at least one amino acid substitution, deletion and/or addition in any one or more of domains F and G, and domains A through to E or a region proximal thereto of said DNA polymerase and associated with resistance or decreased sensitivity to ADV, LMV, TFV, or FTC; or ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; or ADV and LMV and TFV; or ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; or ADV and FTC and LMV and TFV, wherein the presence of such a mutation is an indication of the likelihood of resistance to said ADV, LMV, TFV, or FTC; or ADV and LMV; ADV and TFV; LMV and TFV; FTC and ADV; FTC and TFV; FTC and LMV; or ADV and LMV and TFV; or ADV and FTC and TFV; TFV and FTC and LMV; ADV and LMV and FTC; or ADV and FTC and LMV and TFV wherein the HBV comprises a DNA polymerase having a mutation selected from the list consisting of rT38K, rA181V, rR55H, rY245H, rS/T78S, rV80L, rN/S118N, rN/K139K, rE142V, rA/T181A, rI204M, rQ/P/S/Stop215S, rE/K21E, rN/H238H, rT128N, rN236T, rL180M, rM204V, rQ215S, rT128S, rN238T, rI80L, rI204M, rN238T, rI187V, rN248Q, rS256G, rI122V, rA181T, rL180M, rA/V200V, rM204V, rV214A, rH237H/P, rV253G, rN238T/A, rN238T, rN123N/I, rS135Y, rV214A/V and rQ215Q/P/Stop/S.

51. The method of Claim 50 wherein the HBV comprises a surface antigen having a mutation selected from the list consisting of sQ30K, sE44G, sA47T, sI126T, sA159V, sL173F, sF55S, sC/Stop69C, sC/Y76Y, sI/V110I, sN/T131N, sN134Y, sStop/W172W, sStop/W196W, sS/R207R, sV14A, sL95W, sV96G, sI208T/I, sL95W, sL196W, sT47A, sW172Stop, PreS2 T6S, sT47A, sP62L, sL/F192F, sI195M, sS53L, sL42R, SQ102Q/R, sT115T/S, sS207S/R, sL215R and sL216 stop.

52. A vaccine comprising an agent selected from a surface component of a variant HBV as defined in any one of Claims 1 to 34; a combination of a variant HBV as defined in any one of Claims 1 to 34 and another anti-HBV agent; and an agent inhibitory to a variant HBV as defined in any one of Claims 1 to 34.